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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-------------------------|-------------|-----------------------|---------------------|------------------|
| 10/799,177 | 03/12/2004 | David Spencer Pearson | BBNT-P01-015 | 8150 |
| 28120 | 7590 | 03/27/2008 | EXAMINER | |
| ROPS & GRAY LLP | | | SONG, HOSUK | |
| PATENT DOCKETING 39/41 | | | | |
| ONE INTERNATIONAL PLACE | | | ART UNIT | PAPER NUMBER |
| BOSTON, MA 02110-2624 | | | 2135 | |
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| | | | 03/27/2008 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/799,177 | PEARSON ET AL. | |
| | Examiner | Art Unit | |
| | HOSUK SONG | 2135 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 12 March 2004.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-27 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) 12-26 is/are allowed.
 6) Claim(s) 1-8, 10, 11 and 27 is/are rejected.
 7) Claim(s) 9 is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 12 March 2004 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____ . |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :1/28/08;1/14/08;10/16/07;8/13/07;1/22/07;7/20/06;1/30/06;2/10/05.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3,5-8,10-11,27 are rejected under 35 U.S.C. 102(e) as being anticipated by Phoenix et al(US 6,801,626).

Claim 1: Phoenix disclose determining one or paths for transporting secret keys, using QKD techniques, across the QKD network in (col.1,lines 41-57). Phoenix disclose transporting the secret keys across the QKD network using the determined one or more paths in (col.3,lines 6-20).

Claim 2: Phoenix disclose using a centralized path determination algorithm for determining the one or more paths in (fig.1).

Claim 3: Phoenix disclose using distributed path determination algorithms for determining the one or more paths in (col.3,lines 29-44).

Claim 5: Phoenix disclose determining multiple disjoint, or partially disjoint, paths for transporting secret keys across the QKD network in (fig.1).

Claim 6: Phoenix disclose determining link metrics associated with quantum cryptographic links of the QKD network in (col.8,lines 42-48).

Claim 7: Phoenix disclose determining the one or more paths based on the determined metrics in (fig.2).

Claim 8: Phoenix discloses exchanging a respective number of secret keys bits between each node of the QKD network using the QKD techniques in (col.12,lines 64-67;col.13,lines 1-17).

Claim 10: Phoenix disclose determining one or more paths for transporting the secret keys towards a destination across a QKD network using quantum cryptographic techniques in (col.1,lines 41-57). Phoenix disclose receiving the secret keys from other nodes in the QKD network and routing the secret keys towards the destination across the QKD network using the determined one or more paths in (col.3,lines 6-20 and fig.1).

Claim 11: Phoenix disclose one or more interfaces configured to receive secret keys from other QKD relays in a QKD network and determine one or more paths for transporting the secret keys, using quantum cryptographic techniques across the QKD network in (fig.1 and col.1,lines 41-57). Phoenix disclose route the secret keys towards a respective destination across the QKD network using the determined one or more paths in (col.3,lines 6-20 and fig.1).

Claim 27: Phoenix disclose first data identifying a first node in a quantum cryptographic key distribution (QKD) network and second data identifying a number of second nodes that neighbor for the first node in the QKD network in (fig.1 and col.1,lines 41-50).Phoenix disclose third data comprising link metrics associated with quantum cryptographic links between The first node and each of the second nodes in (col.3,lines 6-20 and fig.1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Phoenix et al(US 6,801,626) in view of Cotter et al(US 6,272,548).

Claim 4: Phoenix does not specifically disclose using a shortest path first algorithm for determining the one or more paths. Cotter discloses this limitation in (col.6,lines 14-21). It would have

been obvious to person of ordinary skill in the art at the time invention was made to employ shortest path algorithm as taught in Cotter with system of Phoenix in order to route the packets from source to destination over the path at least cost and reducing packet delay.

Allowable Subject Matter

Claims 12-20-26 are allowed.

Claims 12,18,19,20,21: Prior art of record does not teach determining a respective number of available secret keys bits exchanged with the each of the neighboring nodes and determining link metrics associated with each of the quantum cryptographic links based on the respective number of secret key bits exchanged with the each of the neighboring nodes.

Claim 25: Prior art of record does not teach second data identifying a first number of secret key bits exchanged with the first neighboring node via quantum cryptographic mechanisms and third data comprising a link metric associated with a link to the first neighboring node, the link metric being based on the first number of secret key bits exchanged with the first neighboring node.

Claims 13-17,22-24 are allowed because of dependency.

Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Information Disclosure Statement

The following reference not considered at this time because of missing dates.

Nambu, Y, et al. ‘BB84 Quantum Key Distribution System based on Silica Based Planar Lightwave Circuits,’.

USPTO Contact Information

Art Unit: 2135

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOSUK SONG whose telephone number is 5712723857. The examiner can normally be reached on mon-fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, KIM VU can be reached on 5712723859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HOSUK SONG/
Primary Examiner, Art Unit 2135